REFLECTIONS: WATER FOR PEACE

The Climate Reality Project
INDIA & SOUTH ASIA

National Institute of Urban Affairs

WICCI
WOMEN'S INDIAN CHAMBER OF COMMERCE AND INDUSTRY
WATER RESOURCES COUNCIL

Development Alternatives

Reflections: Water for Peace

March 2024

Published by: Development Alternatives
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New Delhi 110016. India.
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Tel: +91-11-2654-4100, 2654-4200

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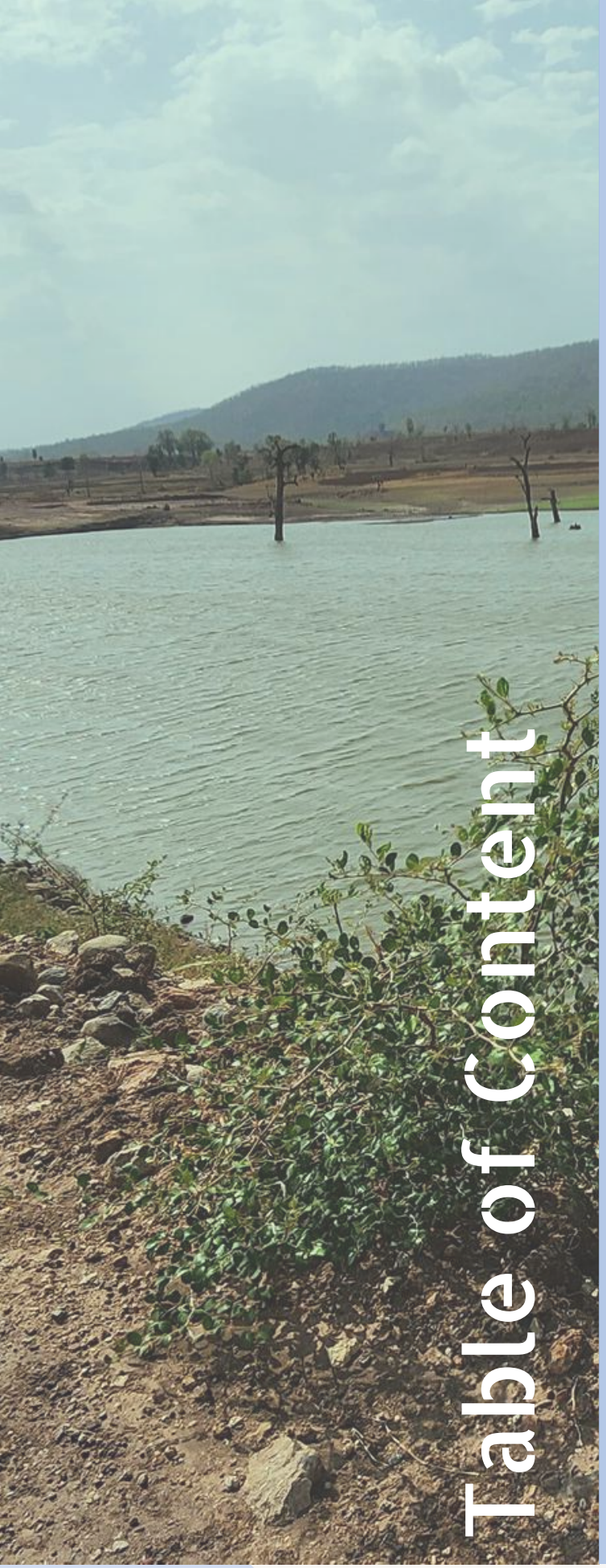

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Introduction

In the vast expanse of our planet, amidst its shimmering blue seas, rushing rivers, and tranquil lakes, lies a silent yet omnipresent force that sustains life itself - water. As humanity stands on the cusp of the third decade of the 21st century, the significance of water in our collective journey towards peace and sustainable development cannot be overstated.

The World Water Day of 2024 carries with it a profound theme - "Water for Peace." It beckons us to recognize water not only as a connector for peace but also as a potential trigger for conflict. In a world grappling with the burgeoning water crisis, where some regions face the cruel irony of abundance while others confront the specter of scarcity, the management of this precious resource emerges as a paramount concern.

Within the pages of this e-book, titled "Reflection: Water for Peace," readers embark on a journey of introspection, exploration, and enlightenment. Through the lens of various sub-themes, the intricacies of water governance, equity, and sustainability are explored, while also celebrating the timeless wisdom encapsulated in traditional knowledge systems.

Each chapter serves as a testament to the indomitable human spirit, as researchers, practitioners, and community leaders share their insights, experiences, and triumphs in the realm of water management. From the imperative of gender equity in the water sector to the symbiotic relationship between water and culture, from the innovative frontier of water technology to the imperative of financing for water sustainability, contributors illuminate the path forward with clarity and conviction.

As the vision of water extends beyond the confines of the 2030 Agenda, readers are compelled to confront the stark realities of climate change and its profound implications for water security. Yet, even amidst these challenges, solace is found in the resilience of the human spirit and the power of collective action.

Through this e-book, an invitation is extended to all stakeholders in the global water community to join in this introspective journey. Let us heed the call to action, as we strive to forge a future where water flows freely as a harbinger of peace, prosperity, and sustainable development for all.

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Theme: Water and Culture

Water, Water Anywhere? A Kingdom for a Drop

In the ongoing battle between mankind and nature, it may seem that humanity is prevailing, but in truth, it is destined to lose the war. Before we even manage to fully disrupt our climate systems and extinguish other species sharing our planet, the destruction of its delicate life support systems will likely eradicate what we now call civilization.

The exponential growth of population, coupled with an insatiable demand for resources, is clearly unsustainable given our finite resource base. While human ingenuity and technology can offer temporary reprieves, they cannot address the underlying, fundamental problem, as Elon Musk aptly notes. Only by slowing the growth of demand for environmental services can we hope to mitigate the impending crisis.

Over the past four decades, the constraints imposed by nature have become increasingly evident to some, though regrettably not to many. Most people, much like ostriches burying their heads in the sand, find it easier to ignore impending danger than to enact the necessary changes to confront it. However, annual droughts and floods worldwide serve as early indications of the consequences of our negligence.

Despite mounting evidence, many fail to recognize the urgency of the situation until it's too late. Fossil fuels, once seemingly abundant, are rapidly depleting. The threats to vital life-support systems such as the ozone layer, climate stability, and biodiversity have escalated to the forefront of global concerns within a mere decade of their recognition.

Water, essential for nearly all human activities, is poised to become the focal point of major conflicts in the coming decades. The signs of such conflicts are already apparent, masked by uneasy truces and agreements. From the American Southwest to the Danube basin and the Indian subcontinent, tensions over water resources have surfaced between nations, provinces, and communities.

Traditionally taken for granted, water is now transitioning from global abundance to local scarcity due to unchecked population growth and economic activity. Historically treated as an open-access resource, water has been utilized without regard for its true cost or long-term availability. Recent studies reveal that water is grossly underpriced, leading to wasteful consumption patterns in agriculture, industry, and households.

Effective water management necessitates appropriate pricing to reflect its true value and scarcity. By pricing water judiciously, we can ensure equitable access while discouraging wasteful usage. Failure to address these issues will only exacerbate the looming crisis, jeopardizing not just civilization, but life itself.

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Theme: Water and Culture

I am Water! Let me flow

I am water that falls from the skies and livens up your lives;
Flowing down the mountains, forest, valleys and the slides;
I am water, I cut deeper than a knife,
Moulding myself with every curve and bending with a stride;

I am water, lifting the parched earth and relieving souls with my might;
Filling up the wells and the lakes as I unwind.
I find my path through the streets and waterways;
A smile to the farmer and the woman who carries my weight.

I am water, and least that you know,
You kill me with your spills and drying me up bit by bit;
Plastics, oil, pesticides, when I look at myself, I cry!
Stop stripping my dignity, I don't like it a wee bit.

I am water, let me flow, unbridled and unaltered,
With a spring in my gait, and a music that I make,
Don't dam my flow, let me run my course,
Recharge heaven and the earth, before my ultimate breath.

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Theme: Water and Culture

Ripples of Destiny: Water's Tale Through Time

In the dance of time, through ages untold, water, both giver and taker, behold! A silent witness to peace and strife, shaping destinies, defining life

Flowing freely, without bound or care, across borders, it dares to share, rivers above, aquifers below, a lifeline for all, a constant flow

In India's tapestry, deeply woven, water revered, its blessings proven. From sacred Ganges to Yamuna's grace, cultures shaped by its life-giving embrace

Yet as progress forged its relentless path, water's value faded, a aftermath. Divided by boundaries, obstructed by dams, its essence commodified, its purity in shams

Ethno-hydrological tales unfold, of worship, of life, a story old. But as infrastructure rose, its true worth lost, forgotten were lessons, at great cost

Aquifers drained for agriculture's thirst, as communities suffered, their voices dispersed. Ostrom's wisdom, a beacon's call, for equitable sharing, lest we fall

Yet conflicts brew, caste against caste, water, once sacred, now a die cast. In this precarious dance, on the brink, cooperation beckons, a final link

Now is the hour, to heed the plea, to see water's soul, as it ought to be. Not mere commodity, but a living stream, in harmony's dance, let us redeem

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Theme: Climate Change and Water Security

The Vital Role of Ecological Interactions in Water Conservation & Climate Action

Water conservation is not just a matter of turning off the tap or fixing leaky pipes. It's more about understanding the intertwined dynamics of ecological interactions, climate change and water conservation that form a complex and crucial nexus. Delving into the intricacies of this nexus is essential for devising effective strategies to mitigate environmental degradation, conserve water and ensure the sustainability of ecosystems. Climate change poses significant challenges to water conservation efforts, exacerbating water scarcity, droughts and extreme weather events. From the microscopic organisms in soil to the species in forests and rivers, each component plays a unique role in maintaining the water cycle, regulating climate patterns and preserving water quality because ecological interactions play an important role. By understanding how different elements of an ecosystem interact with water resources, we can develop more sustainable and effective conservation strategies and improve water indicators. For example, planting trees along riverbanks can help prevent soil erosion, filter pollutants and maintain wetlands. As we know, wetlands act as nature's kidneys, trapping sediments and pollutants while fostering the growth of diverse plant and microbial communities. The intricate network of wetlands not only improves water quality & species diversity but also mitigates the impacts of flood by absorbing excess water during heavy rainfall events. Additionally, aquatic plants, such as seagrasses or algae, oxygenate water and provide habitat for aquatic organisms. Fish and other aquatic species help regulate nutrient cycles by consuming organic matter and controlling populations of algae and other aquatic plants. Such positive interactions among the aquatic community build and run the whole ecosystem, but with anthropogenic activities such as overfishing and pollution, these ecological interactions get disrupted, leading to the degradation of water quality and the loss of biodiversity. In urban environments, we see that green infrastructure offers a sustainable approach to water management by mimicking natural ecological processes.

Green roofs, permeable pavements, rainwater harvesting systems for recharging water, reducing runoff and alleviating pressure on municipal drainage systems. Integrating green spaces into urban landscapes not only enhances aesthetics but also promotes ecological biodiversity, mitigates urban heat island effects and improves overall water quality. In conclusion, the preservation of water resources is inseparable from the principles of environmental ecology. Addressing the challenges posed by water conservation, ecological interactions require integrated approaches that consider the interconnectedness of environmental systems to deal with climate change. Through collective action, we can pave the way for a water-secure future & more resilient coexistence where the delicate balance of nature thrives in peace with human needs.

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Theme: Climate Change and Water Security

Green Water Management – A Case for Urban Forests and Wetlands

Global green water depletion concerns have gained significance in recent years as a component of the freshwater use planetary boundary. Wang-Erlandsson et al., 2022, argue for a renaming of the planetary boundary of 'freshwater use' as 'freshwater change' and bifurcating it to include green water alongside blue water. This would address the issue of green water as distinct from blue water; as a key contributor to blue water stocks (at the aquifer level) and as critical for the functioning of terrestrial processes. A balance between blue and green water stocks and a rate of flow interchange for transformation from one to another must be maintained for ensuring earth system resilience by sustaining a level of "terrestrial wetness that is needed for Holocene like state of the earth system".

Green water consists of water absorbed in the soil and one that moves from soil and plants through evapotranspiration back into the atmosphere. Soil moisture measurements at local levels can indicate the green water potential created by the green infrastructure such as trees, groundcover, parks and hedgerows, urban forests and wetlands.

Both humans and nature share the limited global green-water flows. The change of land use from wilderness to agriculture diverts green water for nature to green water for human consumption to fulfil food, fibre, energy and timber demands. This calls for an assessment of green water scarcity as part of any assessment of water scarcity, food security or bio-energy potential.

[1] This article is based on literature review for an ongoing PhD research on "the reciprocal relationship between social and institutional learning systems and Nature based Solutions to enhance resilience of urban water systems in India". by the author.

The role of forests in directing moisture laden winds deep into the continental land mass and in attracting rain calls for maintaining continuous forest clusters. Land-use change is the biggest driver of green-water loss (transformation to blue). Large scale deforestation and urbanization are the largest drivers of green water potential reduction with impacts visible at local and regional levels.

With water scarcity becoming a global concern, cities, especially in the rapidly urbanizing countries such as India are seeing water crises seen mainly from the blue water lens and the associated crises of reduction in the green water potential in urban areas is not studied adequately. This is of special concern as green water potential regeneration depends on timescales of vegetative growth and ecosystem recovery that are relatively slow and can take decades with long term impacts on ground water and deep aquifer regeneration.

As compared to other blue green elements in an urban setting such as green walls, street trees, parks, urban ponds and lakes; urban forests and integrated wetlands that are the core generators of green water appear to provide a higher range of ecosystem services. These are specifically related to regulatory and supporting services, thus maintaining the green water balance at the local and regional levels. However, in the context of the rapidly urbanizing global south, the supporting ecosystem services provided by urban forests and wetlands are least studied and inadequately included in urban planning, with the focus largely on temperature regulation, storm water management and cultural services of urban trees and forests.

While the benefits of urban vegetation, specifically urban trees and forests have been enumerated amply in literature, more research is required to understand the impact of urbanization related discontinuities in inland forests on water security in cities. A comprehensive cost-benefit analysis of urban forests is required to mainstream its integration into urban planning. By recognizing the interconnectedness of green and blue water systems and prioritizing the conservation and restoration of green infrastructure, communities can enhance water security, mitigate climate risks, and promote sustainable urban development.

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Theme: Climate Change and Water Security

Reimagining Water Security

Nature is bounteous and helps find answers in all its manifestation. The phenomena of climate change is not new on the earth but the pace and causes are different this time. One aspect of climate change and water security that comes to my mind is plumbing in buildings. Plumbing has a significant contribution in shaping the growth of our cities. Plumbing has changed our way of thinking, so much so that we think that water comes from taps and that it is source of fresh water. Our water storage structures revolve around the quantity and duration of water that comes through our taps. We do not consider the RO wastewater as per of our challenges. Similarly, once the wastewater is flushed away from our washrooms, we are severely disconnected with the outcome thereafter. This dual benefit of access to water within our homes and disposal of wastewater from our homes has provided us with immense sense of water security and comfort. However, as the numbers grew in cities, the water demand and the generation of wastewater continued to grow too. Our belief that it is possible to get water from distant land through pipelines and relieve wastewater in rivers and lakes distant from us also grew. Our belief that water is limitless, made us develop scant regard for the original natural resource itself. So much so that because heavy rains lead to water logging in cities and traffic snarls, we started wishing away the rains. We believed that we are not responsible for the droughts, it is an agriculture problem, we do not need to carry out rainwater harvesting, it is a school project. However, in order to survive climate change, it is rainwater harvesting, use of treated water reuse strategies, using the advanced plumbing system which will work best. Water sharing between neighbouring households, sharing plumbing lines, combined rainwater harvesting by all households can only be achieved through peaceful coexistence between neighbours, neighbourhoods and goodwill amongst all. Equitable distribution of water that will help us to come out of the tough times ahead! It is my belief that our depleting groundwater tables, intruding seawaters and changing rainfall pattern, drying springs will make us truly believe in community living.

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Theme: Climate Change and Water Security

Mitigation Banking: A Solution for Water Security and Climate Resilience

Introduction In a world grappling with the challenges of climate change, the 2024 World Water Day theme on "Water for Peace" resonates profoundly. Amidst this crisis, conscious water management becomes a priority. As per UNICEF, urgent action is imperative as more than 2 billion people reside in nations with insufficient water supply, and an additional 785 million lack access to basic clean water. Additionally, the looming threat of climate change is set to exacerbate water scarcity, impacting 700 million by 2030. Embracing sustainable practices becomes crucial for building climate resilience. Mitigation Banking offers an innovative solution by enhancing global water quality, mitigating floods, and safeguarding biodiversity.

What is Mitigation Banking? Mitigation Banking is a designated wetland, stream, or aquatic resource restored to compensate for unavoidable impacts from development or climate change. Evolving into environmental stewardship, it preserves habitats and establishes a balance between economic development and conservation, ensuring no-net loss for the ecosystem. Developers (Such as - government agencies, private enterprises, or NGOs) initiate Mitigation Banking, creating a habitat "bank" to offset environmental disruptions. Credits representing ecological value are sold to developers, generating revenue for climate initiatives. The entity responsible for maintaining the bank ensures long-term ecological preservation and strikes a balance between environmental conservation and developmental requirements.

Relevance of Mitigation Banking in India The Ramsar Convention on Wetlands, an international treaty focused on conserving and sustainably managing wetlands globally, reports that India has approximately 4.6% of its land area as wetlands.

Nevertheless, the persistent surge in infrastructure development, largely propelled by population growth and technological advancements, underscores the importance of adopting mitigation banking. This approach facilitates the restoration of wetlands and marshes, crucial for providing essential ecosystem services like water regulation, flood control, water purification, and fostering socio-economic benefits for the economy. Given that over a billion people globally, about one in eight, depend on wetlands for their livelihoods, the loss of 35% of the world's wetlands to rapid urban expansion since the 1970s emphasizes the critical need for wetland restoration in India.

To highlight the significance of wetlands, consider these examples outlined in reports by the Ramsar Convention on Wetlands: nearly one-third of Kolkata’s sewage is efficiently treated by the East Kolkata marshes which also supports the livelihood of 20,000 people. Furthermore, Chilika Lake in Odisha, the largest coastal lagoon in India, acts as a natural water filter. The dual role of wetlands in sewage treatment and water purification showcases their immense importance in sustaining both ecosystems and communities. In conclusion, conserving wetlands is crucial for environmental protection and sustainable water resources. Mitigation Banking stands out as an effective strategy, fostering harmony between conservation and development. This innovative approach becomes a cure for water security, playing a pivotal role in preserving critical habitats and biodiversity hotspots. As we observe World Water Day with the theme "Water for Peace," leveraging mitigation banking in India is imperative for a sustainable and secure water future.

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Theme: Water Management: Stress and Disaster

Echoes of Drudgery

Most Indian cities facing water problems actually have enough water—but they manage it irresponsibly. Various actions like reducing concrete and protecting lakes are needed, but two solutions can substantially address our urban water problems.

1. Water Efficiency: Stringent standards must be adopted so only ultra-low-water taps, flushes, urinals, washing machines etc can be manufactured and sold. Showers can attract higher taxes—a GST slab far above 28% is needed for products that are unnecessary and harmful to our society. So:

- Hotels and large users must be incentivized and monitored for water efficiency
- Every building must have smart water systems like those by FluxGen
- Some innovation is needed—like for ultra-low water toilets or solids-free sewers We have more than enough solutions—they just need to become the standard.

2. Wastewater Treatment and Re-Use: Wastewater (WW) generated by a city far exceeds its water shortages. This WW can be treated and re-used for non-potable purposes (flushing, greenery, industry, construction). Technology is not a barrier—good policy and its enforcement is.

De-centralized Sewage Treatment Plants (STPs) in large buildings and neighbourhoods, are cost effective and the treated WW can be used locally—it can be easily sold! There are valid quality concerns because most STPs don’t meet standards. So:

- The builder must create a STP O&M fund which will add only 0.25 - 1% to property costs
- The party that installs the STP must also operate it for 10 years, with jail time in case of failures. Then only good players will remain and they will build and operate STPs well

- Automated testing systems provide real-time quality assurance and are cheaper than ever
- Allowing sale of treated WW may even make STPs profitable!
- Nature-based technologies like CAMUS and DEWATS also beautify our cities and reduce electricity costs by 50-80%!! What more can we ask for?

Decentralized STPs will save money that is spent on large sewerage systems—which also often do not work well. India has the dirtiest urban water bodies in the world.

Water need not be a crisis.
We can overcome mis-management and neglect.
The investments needed are not large.
Technology is not a constraint.
Solutions are right in front of us.
Further, we can help the environment and those rural communities we take water from.

The only question is: Do we have the courage and discipline to do the right thing?

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Theme: Water Management: Stress and Disaster

Addressing Maharashtra's Water Crisis: Groundwater Recharge Initiatives in Rural and Urban Areas

In the heart of Maharashtra lies Marathwada, a region long plagued by the relentless grip of water scarcity. Every year, as the monsoon clouds pass by, leaving behind mere droplets of hope, the people of Marathwada brace themselves for another season of parched earth and dwindling water sources. But amidst this adversity, a beacon of hope emerged in the form of the Jal Aatmnirbhar Abhiyan, a visionary project initiated by ICICI Bank.

The Jal Aatmnirbhar Abhiyan was not just a project; it was a lifeline for the communities battling against nature's fury. It aimed to harness the elusive rainwater, transforming it into a sustainable source of life for both rural hamlets and bustling urban centers. With unwavering determination, ICICI Bank set its sights on Kalamb Taluka, District Dharashiv, where 30 villages languished under the weight of water scarcity.

Under the guidance of Col Shashikant Dalvi and the expertise of MAPS Industries, Pune, the Jal Aatmnirbhar Abhiyan sprung into action. Rainwater Harvesting systems adorned public institutions and humble village houses alike, each drop a testament to resilience. Together, they envisioned an annual recharge of 3.7 crore liters of rooftop rainwater, a promise of renewal before the monsoon's return.

But Kalamb Taluka was just the beginning. Across Ambegaon Taluka, District Pune, and 10 Talukas of District Beed, the tide began to turn. In collaboration with Col Shashikant Dalvi and MAPS Industries, ICICI Bank orchestrated a symphony of change. 106 villages emerged from the shadows of water scarcity, their tanks brimming with the bounty of rainwater. Despite the whims of erratic monsoons, these villages stood tall, liberated from the tyranny of tanker water.

Yet, the battle extended beyond rural landscapes. Col Shashikant Dalvi and his team ventured into the heart of urban jungles, armed with innovation and resolve. From government buildings to bustling educational institutions, they weaved a web of Rainwater Harvesting systems, each structure a beacon of sustainability. Together, they channeled over 85 crore liters of rainwater annually, breathing life into the desolate depths of groundwater tables.

The tide of change swept across every corner of Maharashtra, leaving no stone unturned. In recognition of their unwavering commitment, Col Shashikant Dalvi was appointed as a Green Consultant by the Maharashtra Cricket Association (MCA), a testament to their impact beyond borders. At the MCA stadium, amidst the roar of cricketing fervor, MAPS Industries wove a tapestry of awareness. Through slogans and slides, they whispered tales of groundwater recharge, igniting a spark of consciousness in every spectator's heart.

As the curtain falls on this tale of resilience and redemption, one truth remains undeniable. Through strategic partnerships and unwavering determination, ICICI Bank, MAPS Industries, and Col Shashikant Dalvi have not only quenched the thirst of Maharashtra but have also sown the seeds of hope for generations to come. With continued support from the state government and corporate sectors, the journey towards water sufficiency marches on, a testament to the indomitable spirit of humanity in the face of adversity.

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Theme: Water Management: Stress and Disaster

Reflections on Water and Peace

World Water Day 2024 highlights ways in which water management can contribute to peace. I see water management's contribution to peace as coming through sustainable development – aligning with people's aspirations, in ways that bring hope and empowerment. Two angles for how water may contribute to greater peace, harmony, and well-being could be:

- At the individual-society level, by fulfilling the human rights to water and sanitation, and
- At the nature-society level, by respecting nature and ecosystems.

Access to safe water and sanitation at home, school, work, and in public spaces contributes not only to health and well-being but also to freedom of movement and peace. States have a responsibility to put systems in place that provide services to all. To sustain such services – especially for the hardest-to-reach – the provisioning system needs to be resource-efficient and financially viable. Many systems fail to reliably service the full population – and might not even be designed to do so. Poorly designed or insufficiently thought-through projects, policies, or business models may bypass those in need and instead fuel vicious build-neglect-rebuild cycles, where society's resources go into steel and concrete rather than targeted service delivery. Subsidies and financing policies can be repurposed to incentivize services to reach and serve the most vulnerable. Redistribution of benefits can be contentious, however, and must be well-designed, predictable and, most importantly, agreed to across society. Yet, equitable and universal access to safe water and sanitation will contribute to more just and peaceful societies.

At the broader level, water is one of the most critical flows in the nature-society relationship. Learning from Indian water champions and indigenous peoples around the globe, we understand that water cycles can become more beneficial where nature is nurtured. But economies that continue to extract, pollute, and encroach on ecosystems are destroying their own – and others' – resource base. Modern land and water management needs to learn and nurture ways that in still greater appreciation of nature in the way we make a living. Working collectively for the greater good – caring for land and ecosystems, rejuvenating rivers – brings hope, empowerment, development, and not least, peace. Water brings Life. Sanitation brings Dignity. Development for All brings Peace.

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Theme: Climate Change and Water Security

Flowing Together: Citizen Science and Water Conservation

In today's world, where environmental challenges loom large and water resources face increasing pressures, citizen science has emerged as a powerful tool for change. Citizen science refers to the involvement of the general public in scientific research, typically in collecting data, conducting experiments, or even designing research projects. When it comes to water resource management, citizen science offers a unique perspective and an invaluable contribution from individuals passionate about protecting our most vital resource.

From monitoring water quality to tracking changes in aquatic ecosystems, citizen science tools empower individuals to actively safeguard water resources. One of the most compelling aspects of citizen science is its inclusivity—it welcomes people from all walks of life, regardless of their background or expertise. Whether you're a seasoned scientist or a curious amateur, there's a role for everyone to play in the quest for water conservation and management.

In one such citizen science initiative implemented in Udaipur by Development Alternatives, Chetavya Sharma, a young bright student, became fascinated by the intricate dynamics of water systems through his involvement in the Integrated Water Resource Management programme. "Before, water was just something that came out of the tap for me," he reflects. "Now, I understand the importance of monitoring its quality and conserving our local water sources." Through hands-on activities and workshops, participants like Chetavya have become champions of water resource management and conservation practices in their communities.

Similarly, Harshita Jain, a teacher at Alok Public School, integrated citizen science for water management activities into their academic curriculum under the child development programme, inspiring the next generation of environmental stewards. "Seeing my students engage with real-world issues like poor water quality has been incredibly rewarding," she shares. "It's not just about teaching them facts; it's about instilling a sense of responsibility towards managing and conserving our water resources in a better way."

However, citizen science does come with its challenges, particularly in ensuring data accuracy and reliability.

To address this, initiatives often provide training sessions, quality control measures, and opportunities for collaboration between volunteers and professional scientists. By bridging the gap between scientific expertise and community engagement, these initiatives enhance the credibility and effectiveness of citizen science efforts.

In conclusion, applying citizen science to water resource management and conservation offers a promising path forward in tackling the challenges of water insecurity and pollution. Engaging the public in scientific inquiry not only expands data coverage but also fosters innovation, cooperation, and trust among diverse stakeholders. These are essential elements for achieving water management and conservation goals.

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Water's Silent Scream

Water, water everywhere goes the Old Mariner's rhyme,
Water, Water everywhere a tale as old as time,
But is it truly all around, just stop and think,
Evaporated and befouled as water supplies shrink,
"But it falls from the sky!" the same way it has always been,
The life-giving clouds however, are erratically seen,
For the Monsoon season, not without reason, shifts day to day,
Mankind's pride, takes us in stride, and its price we must all pay,
Once punctual, rains fed our fields with life,
Now wilful, their absence causes strife,
Man has hurt the balance as delicate as a feather,
And brought upon himself this awful weather,
Though we scream, protest, pray and cry,
Our future, if continued like this, is bone dry,
My one warning to my son and daughter,
The war for water, yet to come, will be a slaughter,
The only thing to wet the earth, will be the bloodied bodies in the dirt,
Be proud warring men, for 'tis surely not your fault,
The only legacy you leave behind though, is salt.

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Theme: Water Technology

Water Purification in India

It is most intriguing that in spite of the ban on the R.O plants in the country by the Supreme court and the National Green Tribunal almost 5 years ago, they still exist for water purification.

Not only does its use result in high energy consumption, it also leads to 100% water loss. If 10 litres per hour is used to purify drinking water using an RO plant, equal amount of water is rejected as brine or back water (with high concentration of dissolved solids and salts) which ends up spoiling the flora and increasing the salinity of the soil and the surface water. The used cartridges and membranes (plastic in nature) end up in landfills, leaching further and letting out PFAs or micro plastics, further deteriorating the mother earth.

One may ask what the alternative is. Nano filtration using siliceous materials have been researched by our own premier institutes, the CSIR and IMMT of Bhubaneswar, since 2008. Under the tripartite agreement between CSIR, DST and CIPET, the premier institute to design and mould food grade plastic containers, the idea of making a simple standalone purifier was born and licenses were given to 12 purifier manufacturers. Later it went beyond 120 and more licensees paid the fee and acquired the knowhow of manufacturing clay based nano filters.

As the rheology of clay was very dynamic and it's malleability differed in different geographies, the idea was dropped and was not scaled up to reach the need of the 73% of the Indian population who were in the rural unreached places, with daughters and sons were dying just because of 2 tricky bacteria that were playing havoc in water. Most states were not aware that heavy metals like arsenic, beyond permissible limit in water, is responsible for diseases like cancer. Excess fluoride in water in almost all states is responsible for fluorosis or weakening of bones and teeth.

In spite of the Jal Jeevan mission giving hand held water testing kits to almost all panchayats in the country, most of them are kept under lock and key in the panchayat president's room. Watsan Envirotech saw the plight of the last woman in the last mile still extending her empty pot in want of potable water. This is the only company in India to scale up the CSIR technology. It made the clay filters and also its variants to remove arsenic and fluoride from the water and to make this potable water reach almost 500,000 rural households.

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Theme: Water Management: Stress and Disaster

Water for Peace: Turning Shared Resources into Shared Opportunity – A Call for Action Amidst Crisis

For billions worldwide, water isn't merely a resource; it's a matter of survival. Yet, Water, our planet's lifeblood, is increasingly a global concern as populations surge and the climate shifts. A staggering two billion3 People worldwide lack access to safe drinking water, and half of humanity grapples with severe water scarcity at some point each year. The crisis is set to worsen with the twin pressures of climate change and population growth.4 Affecting disproportionately the poor and disadvantaged, perpetuating cycles of poverty and instability across the globe5.

History shows water can be a source of conflict, but it's also driven nations to work together. Water-sharing treaties prove this. Water can bridge divides, not widen them. Let's view water as a reason to collaborate, not fight. It's a powerful tool for peace. The choice is ours. Here's why a "Water for Peace" mentality benefits all:

- **Meeting Basic Needs:** Cooperation ensures safe, reliable water for drinking, sanitation, and health across borders.
- **Fueling Economic Progress:** Joint optimisation of water use in agriculture, industry, and energy production creates jobs and boosts regional prosperity.
- **Protecting the Environment:** Joint conservation efforts secure clean water resources and preserve biodiversity.
- **Fostering Trust and Stability:** Transparently addressing water challenges builds trust between nations, reduces tensions, and fosters peaceful relations.

However, the complexities of the water crisis cannot be tackled in silos. Integrated water management (IWM) is vital for addressing the complexities of the water crisis. It involves coordinated management of water, land, and related resources to maximise well-being while adapting to challenges like climate change and pandemics.

An Eight-Point Agenda for Cities

To advance this transformation towards effective IWM, Urban 206, under India's presidency, has come out with an eight-point agenda for cities to adopt:

- Re-imagine the role of water managers: Water managers must transcend their technical roles and become facilitators of broader change, collaborating across sectors and engaging stakeholders.
- Leverage urban planning: Integrate water considerations into urban planning to optimise land use and promote water-sensitive design.
- Strengthen the data ecosystem: Invest in data collection and management for informed decision-making.
- Integrate nature-based solutions: Protect and restore natural ecosystems like wetlands to complement engineered infrastructure and boost water resilience.
- Transition to multi-functional infrastructure: To maximise benefits, design infrastructure that serves multiple purposes (e.g., flood control, public spaces).
- Invest in social and human capital: Build the capacity of institutions and communities, focusing on inclusivity and empowering marginalised groups.
- Explore non-traditional sources: Use innovative financing, such as green bonds and public-private partnerships, to fund sustainable water solutions.
- Encourage city partnerships: Facilitate knowledge-sharing and collaborative problem-solving through city networks.

"Water for Peace," coupled with IWM principles, offers hope amidst the water crisis. Water can become a bridge-builder for peace and sustainability through collaboration and innovation. Action is imperative.

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Theme: Gender and Water

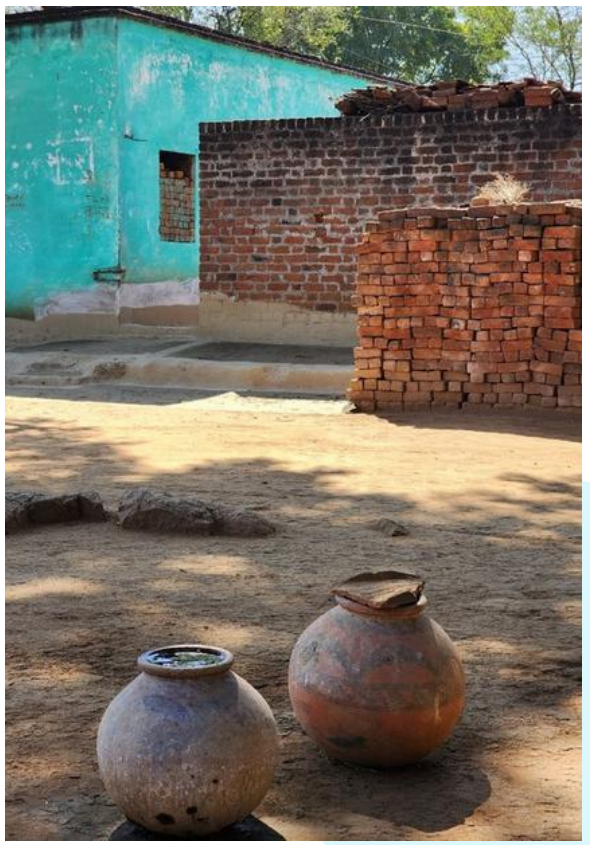
Solving the Urban Water Crisis Forever

But beyond, a tale of plight,
In valleys deep, obscured from light.

A woman walks, a hundred miles,
Through dusty paths, and trails.
Each step a burden, each mile a plea,
For water, the essence of life's decree.

Sacrifice untold in every drop,
Dreams fade, as she doesn't stop.
Oh, towers high, with water grand,
Remember her in distant land.

Let her journey not be in vain,
Through sun, through rain, through pain
Save water, every precious gem,
In towers high, and valleys dim.



The poem tells of contrasting worlds: the comfort of those in tall buildings with flowing water versus the struggle of a woman walking miles for water. It highlights her sacrifices and the importance of each drop. It urges us to remember her plight, save water, and help her journey end.

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Theme: Gender and Water

Enhancing Water Security in Rural India

GRAVIS, an organization working in arid and remote parts of India, has great faith in working on issues related to human development, equality and rural empowerment with active participation of communities of the region where it functions. In the beginning, it started its work in a cluster of 20 villages Rajasthan. At present, GRAVIS works in more than 2,000 villages of 10 districts of the Thar Desert of Rajasthan, Uttarakhand and Bundelkhand (UP) in India covering a population of about 2 million people. It focuses on collective ascension of men, women, and children, regardless caste, or religion they may belong to. The organization works toward the rehabilitation of the rural community, enabling village ownership and control over its environment, institutions, and relations.

In the Thar Desert and other arid zones of India, droughts have been a major challenge and have adversely affected socio-economic development of the communities over a long period of time. Recent climate change manifestations and nature and occurrence of droughts have had a close correlation with varying rainfall and changing weather patterns leading to crop failures. GRAVIS has been leading a communities led climate change adaptation programme through water security and with an emphasis on gender equality. Following are the main strands of our model:

Blending traditional knowledge (grass-root knowledge) and modern technology – in rural India, there is abundance of local knowledge and technologies in the context of water conservation. GRAVIS has comprehensively collected those traditional knowledge pieces and have upgraded those with modern technical inputs leading to cost effectiveness and sustained efficiency of the structures. Innovated design taanka (rainwater harvesting tank) and optimum size and design khadins (farming dykes) are two important examples that GRAVIS has promoted. GRAVIS has also revived over 700 village ponds and over 200 percolation wells. Overall, over 15,000 rainwater harvesting structures have been constructed or revived. In addition, GRAVIS has worked extensively on revival of pastures and forests, as well as on setting up Arid Horticulture Units (AHUs) and Community Seed Banks (CSBs). The model has enhanced water security along with food and nutrition security for about 2 million rural inhabitants.

Community engagement – with active community participation at grass-root level in view, and with sustainability perspective, GRAVIS has worked extensively on formation and development of Communities Based Organizations (CBOs). Its water security programmes over the years have led to formation of over 4,000 CBOs in Thar. Half of the members of these CBOs are women. Many of these CBOs have sustained over a long period of time and have participated in water security interventions actively as knowledge dissemination agents, partners in Govt schemes and as owners of local initiatives.

Documentation, advocacy, and policy support – GRAVIS has documented its water security interventions comprehensively through its various publications that includes best practices, results analysis, and recommendation. We are a strong advocate of replicating the model in arid zones and in mainstreaming drought conditions within developmental programmes and in policy dialogues.

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Theme: Gender and Water

Beneath the Fields

In the heartlands of rural India, where the soil is rich with stories of toil and hardship, I embarked on a journey to work alongside sugarcane farmers. My mission was to improve soil health, agrarian practices, yield and water management. Little did I know, this endeavour would unveil a stark reality of agrarian exploitation lurking beneath the surface. India's agricultural landscape has seen a gradual feminization, with women shouldering the burdens of sowing, weeding, and tending to crops. Yet, amidst this backdrop of resilience, I stumbled upon a sight that shook me to the core – young children, the next generation, robbed of their innocence and education, deployed to plant sugarcane.

It was a scorching day when I witnessed firsthand the plight of these children. From treating the setts with organo-mercurial compounds to enduring hours of backbreaking labour under the blazing sun, they toiled for a meagre sum of INR 150 a day. Their tiny hands, unprotected and vulnerable, came in contact with harmful chemicals, painting a grim picture of exploitation. During one such encounter, I mustered the courage to ask a boy, if he attended school. With a weary smile, he replied, "Yes, but today is a holiday. I'm planting to earn for my family and pay my school fees." His words struck a chord within me, revealing the harsh truth behind his sacrifice.

He had his science exam the next day and he was toiling in the field – not because of a choice, but due to circumstances beyond his control. His dreams deferred, he juggled between textbooks and hardships, hoping for a better tomorrow amidst the harsh realities of today. As I pondered over his words, grappling with conflicting emotions, I realized the complexity of the situation. Was it agrarian exploitation, perpetuated by a system that preyed upon the vulnerable? Or was it the harsh compulsion of survival, forcing these young souls to bear the burdens of adulthood prematurely?

In that moment of introspection, I resolved to channel my efforts towards not just improving agricultural practices but also advocating for the welfare of these children. As the sun dipped below the horizon, casting a golden hue over the fields, I carried with me the echoes of their silent struggles, committing to advocate for them in a world that often turns a blind eye to their plight.

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Theme: Visualising Water beyond 2030 Agenda

Transactions for Peace in Water

Conflicts make more headlines as ‘something’ happening, whereas peace buildings get sidelined as normal. Digging deeper, one finds that conflict is considered profitable, thus driving society’s interest, and peace is considered priceless in terms of no price or morally precious, thus making it normative. No wonder, there is more budget for conflict management than for peace building process pretending that both are same. Taking a case of water, I am sharing an experience of teaching a Master’s level course on Water Security and Conflict Management at TERI School of Advanced Studies, New Delhi where peace emerged central to sharing of water at all levels (from the rural to the global) with a clear indication that there are transaction costs involved in the peace process which needs factoring separately from conflict management. The attributes that determine peace in water matters need to be acknowledged and advocated in everyday discourses and deliberations. These attributes establish a scholarship that is urgent in the current state of social-ecological disturbances augmented by the climate crisis which is majorly manifested through water crises. These attributes are highlighted here through case studies developed by the students. The Indus River, sitting as the longest peace process in the international transboundary water management through the Indus Water Treaty between India and Pakistan, tells that even in the roughest geopolitical situations, water is instrumental to hold peace. Both the countries are investing heavily in the peace process. At the national level, every river being an interstate body, the water share between the regions is natural and yet constitutionally ensured through the fundamental right to life. There are formal and informal arrangements made between the regions, and a dam is a classic cost of the same. At a local level, the upstream and downstream villages of the Godavari River basin in Nashik, Aurangabad and Ahmednagar districts show an interdistrict level of water sharing through a series of social engineering process resulting in a series of collective agreements beyond water sharing to cropping, irrigation, water harvesting and even social decisions. Another case is the Kolans River flowing through rural Sehore district and dammed to create the mighty Bhoj wetland before entering urban Bhopal have arrived to a saga of upstream and downstream share for monsoon and summer.

Within a city (and towns/villages), the queues at the water tankers and water kiosks in the low-income habitations are indeed a peace process built through informal rules augmented with community vigilance and cooperation. In the rural areas, collective visits to the ponds/lakes daily for domestic and drinking purposes besides engaging for livelihood and community purposes are a self-organised peace process with community designed rules for water management. In rural/low-income areas, it is also observed that if the water bearer of the family is found absent at the water collection place and time, the others from the community ensure that water reaches the house of the absentee. The water collection places are crucial public realms to discuss everything and anything under the sun that matter to a family and the community which lays the foundation of collective living. The key learning is dependency on access to water is fundamental to peace building process. That peace entails transaction costs in several ways, from financial, in/formal rules, human resources, time, kind, trust, and is worth an investment for long term social-ecological sustainability. Let us encourage more scholarship and policies towards peace process in water management factoring a cost.

About The Climate Reality Project

The Climate Reality Project (CRP) aims to catalyze a global solution to the climate crisis by making urgent action a necessity across every sector of society. CRP recruits, trains, and mobilizes people of all walks of life to work for just climate solutions that speed energy transition worldwide and open the door to a better tomorrow for us all.

About National Institute of Urban Affairs

The National Institute of Urban Affairs (NIUA) is India's leading national think tank on urban planning and development. As a hub for generation and dissemination of cutting-edge research in the urban sector, NIUA seeks to provide innovative solutions to address the challenges of a fast urbanising India, and pave the way for more inclusive and sustainable cities of the future.

About Women's Indian Chamber of Commerce and Industry

Women's Indian Chamber of Commerce and Industry (WICCI) is a premier National Business Chamber for Women envisioning Global Impact for Women Entrepreneurs, Businesswomen and Professionals from all walks of life. WICCI drives fundamental changes in governmental policies, laws, incentives and entrepreneurial ecosystems, with a view to robustly encourage and empower women in business, industry and commerce across all sectors and fields.

About WforW Foundation

WforW Foundation is a Think Tank built as a Citizen Collective thriving on hope and trust and facilitating water conversations on the information and knowledge available on the water matters through various ways of communication and collaborations with the water enthusiasts with an aim to work collectively towards water conservation.

About Development Alternatives

Development Alternatives (DA) is a premier social enterprise with a global presence in the fields of green economic development, social empowerment, and environmental management. It is credited with numerous innovations in clean technology and delivery systems that help create sustainable livelihoods in the developing world. DA focuses on empowering communities through strengthening people's institutions and facilitating their access to basic needs; enabling economic opportunities through skill development for green jobs and enterprise creation; and promoting low carbon pathways for development through natural resource management models and clean technology solutions. DA works in addressing **three global challenges** namely-

Resource Efficiency and Circular Economy - Accelerating the transition to inclusive and circular modes of production and consumption by reducing carbon and material footprints across the lifecycle of economic activity while promoting local value and wealth creation.

Climate Resilience and Ecosystem Restoration - Regenerating lost biodiversity and degraded ecosystems and building resilience to climate change and extreme events in a manner that also generates prosperity.

Livelihood Security and Inclusive Entrepreneurship - Innovative business models and institutional ecosystems to empower local entrepreneurs for creating businesses that generate jobs and deliver basic needs.

Our solutions in addressing these issues are focused in nine sectors- namely Waste Management, Human settlements, Decent work, Climate Response, Sustainable Enterprise, Empowering Communities, Water Solutions, Sustainable Agriculture, and Green Energy.

Since 1982, Development Alternatives has impacted approximately 20 million lives.

Development Alternatives

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